"I am sorry to say that the 'fish booming and drumming,' described by Charles Kingsley, was not to be heard. Either we were there at the wrong season, or the fish had been driven away by the use of dynamite. From all I heard, the sound was identical with that produced by the drum-fish so common in the Indian river of Hinda."

ROBERT MALLET, F.R.S.

THIS eminent engineer, whose researches on earthquakes are so well known to scientific men, died on the 5th inst. at the age of seventy-one. During his very active career he accomplished a vast amount of work, of which his "Earthquake Catalogue" and other published books and memoirs form the best monument.

Robert Mallet was born in Dublin on June 3, 1810. He was descended from the representative of a Devonshire family who had settled in Ireland, his father being the owner and manager of an engineer's factory. During childhood Robert Mallet appeared to be of weakly constitution, but he grew up to be a man with great powers of endurance. His taste for science was exhibited at a very early period, and before he had reached the age of twelve years he had established a laboratory in his father's house, where he delighted in performing chemical experiments. After being taught in a private school in Dublin, and making a tour on the Continent, he entered as a student at Trinity College, Dublin, and in 1830 completed his studies there by taking his M.A. degree. In 1831 he made an extended tour on the Continent, and, upon his return, married, and entered into partnership with his father. From this time forth he was busily engaged in various engineering projects both in the capital and in various parts of Ireland. Private study and research were, however, by no means neglected during these busy times, and in the very year of his commencing business we find him publishing his first paper on the motion of glaciers. He had before this time been elected a member of the Royal Irish Academy. In 1839 Mallet was elected a member of the Institute of Civil Engineers, and in the same year made his important invention of "buckled plates," an invention which was not patented till 1852, the patent being prolonged in 1866. It was in 1846 that Mallet published his first paper on Earthquake Phenomena; this memoir, which appeared in the *Philosophical Magazine*, gave a simple explanation of the supposed "vorticose movements" during earthquakes, and two years later a paper in the *Transactions* of the Royal Irish Academy contained a full exposition of his views on the wave-movement in earthquakes, with which every one is now familiar. During subsequent years Mallet published in the British Association Reports his papers, which aimed at drawing up a complete catalogue of earthquakes, with various contributions to seismology and seismometry. In 1857 occurred the great earthquake in the Neapolitan territory, and in the following year Mr. Mallet was commissioned by the Royal Society to proceed to the district and to study its effects.

The results of his observations were published in two volumes in 1862. In 1858 the Earthquake Catalogue was completed by Robert Mallet with the aid of his son, now Prof. J. W. Mallet of Virginia. About this time we find Mallet engaged in experiments upon artillery, and in calling attention to a new gun which he had invented, but which never seems to have been of much practical utility. In 1872 Mallet laid before the Royal Society a memoir, to which he had evidently, during many years, devoted much time and labour; it was entitled "On Volcanic Energy, an Attempt to Develop its True Nature and Cosmical Relations."

Whatever differences of opinion may be entertained as to the truth of the theory which is there sought to be established, there can be none whatever as to the value of the experiments which constitute its basis, or of the important influence which it has exercised upon geological thought and speculation. This important memoir, which was published in the *Philosophical Transactions*, has been translated into German by Prof. von Lasaulx, who has added a valuable commentary to it.

During the later years of his life, Mallet, who had removed from Dublin to London, was afflicted with almost total blindness, but he nevertheless continued to make occasional contributions to his favourite branches of science. Altogether he was the author of more than seventy memoirs, besides separately published works. Mr. Mallet was elected a Fellow of the Royal Society in 1854 and of the Geological Society in 1859; in 1877 he was awarded the Wollaston medal of the latter society.

THE LAND OF THE MIDNIGHT SUN[1]

UNDER the above striking title we have an account of the Peninsula of Scandinavia and of the life of its people, based on a series of journeys made at different times from 1871 to 1878, by Mr. Paul Du Chaillu. It is pleasant to meet with an author, already so well known for his travels in Equatorial Africa on new ground, and to find that his journeyings on virgin soil and among wild and savage races have not unfitted him for the study of the physical characteristics of an old country, and of the manners and customs of its inhabitants. The reader of these two handsome and well-illustrated volumes may form some notion of the extent of ground traversed during a five-years' sojourn, from the tracings of the author's routes on the map appended to the first volume. Not only was the country travelled over from north to south and from east to west, but the coast-line from Haparanda to the extreme north-eastern point of Norway, a distance of 3200 miles, was observed, the greater part of it both in winter and in summer, and over 3000 miles of fjords were sailed along. The illustrations are most frequently from photographs, but those representing Lapland winter scenes are the work of a Swedish artist.

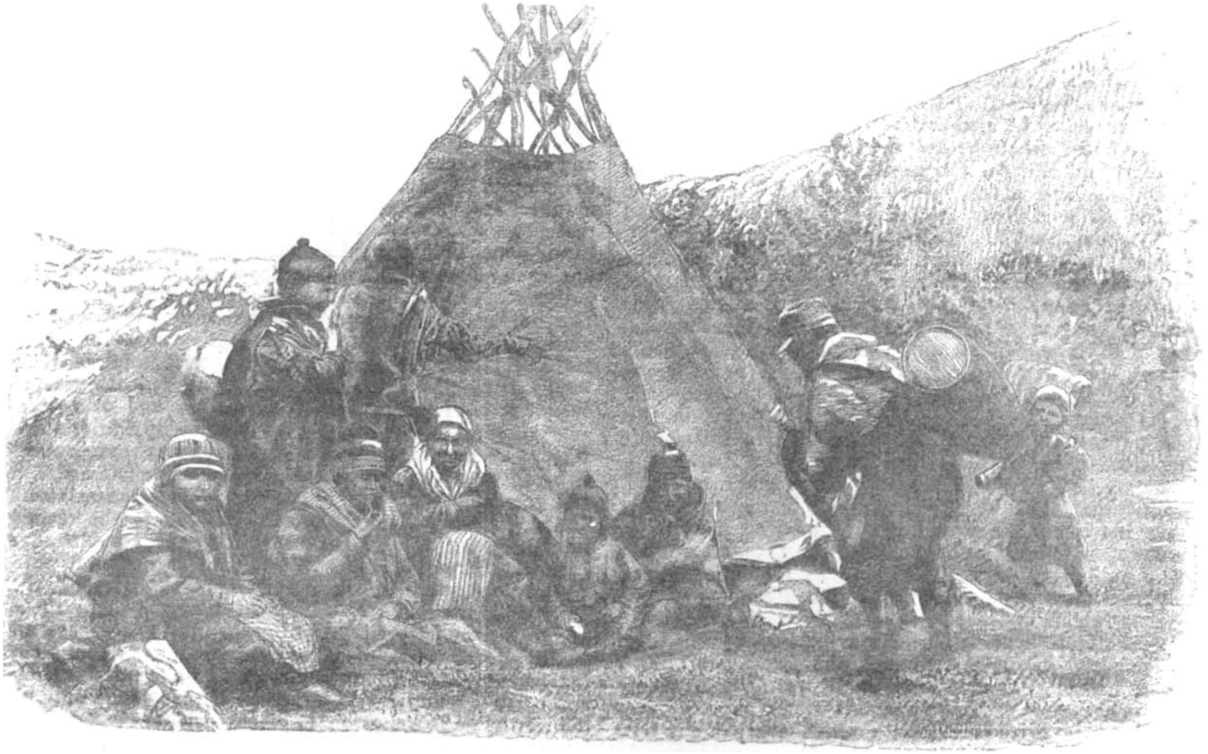
A great many pages of this work, while pleasant reading, will not afford much new information to the reader who may have already travelled in Sweden or Norway. The route from London to Göteborg, Stockholm with its beautiful suburbs, Upsala, Christiania, Bergen, the Dovrefeld, the splendid scenes of the Romsdal; these and a few more well-known routes and places are all within the compass of an ordinary summer's tour; but Du Chaillu has told of these all in an attractive and appreciative manner, and he treats of many such only by the way as he journeys on to places seldom visited even by the sportsman in pursuit of game. He gives a good deal of interesting information about the Laplanders. The Lapps are described as kind-hearted, dirty people. Their life during summer is a very hard one. They have to follow their reindeer day and night, lest the herds should wander. Coffee was their principal drink, mixed with the thick reindeer's milk. They were a fair-haired and fair-skinned people, with blue eyes, prominent cheek-bones, and the nose *retroussé*. The men were from four feet five to five feet and one-quarter inch in height, and three women measured four feet and one-quarter, four feet and three-quarters, and four feet six and three-quarters of an inch in height respectively. It was at the Lapp village of Jockmock that Prof. Baron von Düben, so well known and appreciated in this country for his writings, was met with. He was engaged in the study of the Lapps when Du Chaillu, fatigued and hungry, found himself entering the station. Longing to see a human face, he saw the Professor approach; and although he had never before met him, he addressed him correctly at once. He brought Du Chaillu to the neighbouring parsonage; food was soon before him, and a hearty welcome. We incidentally learn that several of the illustrations of Lapland which accompany this narrative are from original photographs taken by the talented wife of the Baron.

---

[1] "The Land of the Midnight Sun: Summer and Winter Journeys through Sweden, Norway, Lapland, and Northern Finland. With Descriptions of the Inner Life of the People, their Manners and Customs, their Primitive Antiquities, &c." By Paul B. Du Chaillu. In two volumes, with map and 235 illustrations. (London: John Murray, 1881.)

A Laplander's encampment would not seem to be a savoury place. A Lapp tent at its base is scarcely more than eight feet in diameter; it is very portable. The frame is composed of poles fitting into each other, easily put together, and so strong and well knit that they can resist the pressure of the heaviest storm. A cross-pole high up sustains an iron chain, at the end of which is a hook to hold kettles. Over the frame is drawn a cloth of coarse wool called "vadmal," made by the Laplanders, who never use skins; this is composed of two pieces, and is made fast by strings and pins, and well secured. A small door of canvas is suspended over the entrance. Such a tent will last more than twenty years. Some idea of its form can be obtained from the accompanying illustration. Such tents, when removed in winter, are drawn by reindeer in sledges, but in summer they have to be carried on the backs of the reindeer. Hence the moving of a Lapp encampment in summer is a very much more difficult undertaking than in winter.

The chapter on the vegetation within the Arctic circle is disappointingly short. There for some weeks there is little interruption to vegetation. What in these countries of midnight darkness can only be attempted by the aid of a brilliant electric light, is in those countries of midnight light brought about in a less artificial way. Rye planted at the middle of June was seven or eight feet high early in August, growing after first germination at the rate of three inches a day. The barley at Niavi was ready for the harvest six or seven weeks after being sown. Agricultural schools were met with all through Norway and Sweden. These schools seem already to have been of enormous value to the country, raising the standard of agriculture and keeping the students up with the march of progress.

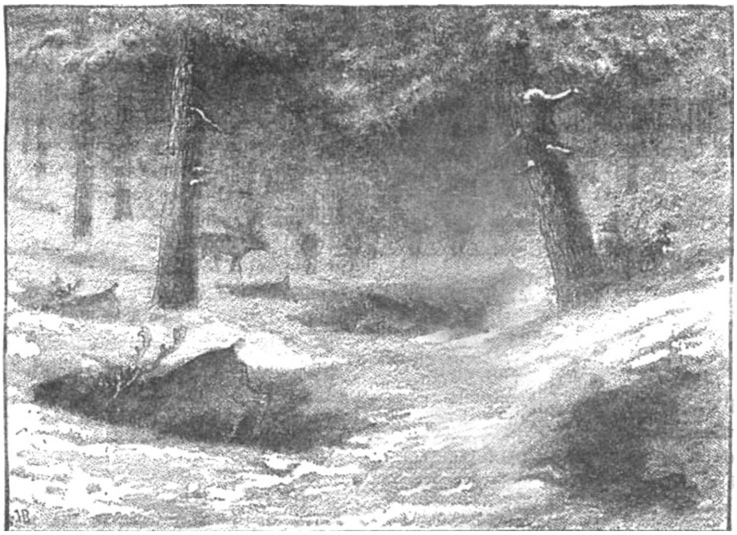


A Lapp Tent.

A second visit to Lapland—this time in midwinter—is described in Volume II. Entering a forest after a long drive, the author found himself suddenly in the midst of a number of holes several feet deep, dug by reindeer. Several thousand reindeer had evidently been at work. The snow was not very deep—not over four feet. Under that cover was buried the moss of which the reindeer is so fond. All except the younger ones were busy digging, first with one fore-foot, then with the other, the holes gradually becoming larger and larger, and the bodies of the animals more and more hidden. They would never stop excavating till they had reached the moss. Wherever one turned their eyes the reindeer were doing the same work, for they were evidently hungry. Their number seemed countless. Some had dug these holes so deep that nothing save the tails of the reindeer could be seen swaying to and fro outside of them.

The following extract, referring to the tame reindeer will be read with interest:—

"Late in April and early in May is the reindeers calving season; the period of gestation is thirty-three weeks: the little ones are either carried or put into a sleigh. When the reindeer cows call for their young they utter a peculiar grunt, which is answered by the calves. Many of the animals had already dropped their horns. The large ones resembled those of stags, but they are smaller: the reindeer is clumsier than the deer, with stouter limbs, shorter head, and a larger and wider muzzle, more like that of a cow; the hoofs are broader and much larger. The hair is grey, very coarse and thick, especially in winter, and sometimes two inches in length; the colour is much darker on the back, and almost white under the belly; the young are lighter-lined than the adults. The colour often varies considerably among different herds, and frequently by this the ownership can be known. The reindeer are never housed, for they like cold weather and snow. Food is never given them, and they will not touch the moss that has been gathered, unless brought up to do so. They often will not even raise their heads as you approach them, and remain quiet when the Lapps pitch their tents, as we have seen. Some years prove unfavourable to their increase, on account of the amount of snow, which prevents them from digging for food; the herd then becomes weak and emaciated, and many die. The spring is also a bad time for them; the snow melts during the day, and a thick crust forms at night, so that their feet break through, causing lameness and disease. The horns of the males, which often weigh forty pounds, attain the full size at the age of five or six years, those of the cow at about four years. The time of dropping the horns in a herd varies from March to May; in the adult animal they attain their full size in September or at the beginning of October. After the age of eight years the branches gradually drop off. The shoulder-blades appear a little high, occasioning a slight hump or protuberance. Without the reindeer the Laplander could not exist in those northern regions: it is his horse, his beast of burden; it affords him food, clothing, shoes, and gloves. Domestic reindeer are a curious admixture of wildness and tameness. In some respects they are greatly superior to other cattle; in a herd they are very easily managed; they usually keep close together, and in the winter season remain where they have been left to feed. When on the march, with the help of dogs, they go in a solid mass, and a herd does not scatter unless wolves are after them; but in summer they often wander a long distance when left by themselves, as is often the case. When harnessed they become uneasy and distrustful, and great caution has to be taken not to startle them. Often trained reindeer, like horses, become refractory or vicious, and very difficult to manage, and then the Lapp shows his skill. The speed of the reindeer varies very much according to the time of the year, October, November, and December being the months in which they are fleetest, as then they are fresh from their summer pasture; the cold weather strengthens them, and they are not exhausted from digging the snow, not yet very deep, to procure their food. The rapidity of their gait depends much on the state of the surface. If this is well packed or crusted, and if previous furrows have been made, they go very fast. Much depends too upon the distance, and whether the country is hilly or not, with a long range of slopes. On the rivers, over well-packed snow and a good track, the animals can go twelve or fifteen miles the first hour, and down a long mountain-slope twenty miles, and even more. They can travel five or six hours without stopping, the first hour rapidly, the second more slowly, and towards the fifth or sixth quite slowly, for by that time they require rest and food. Early in the winter, when they are in good condition, one can travel with a swift reindeer one hundred and fifty miles in a day, where the country is not very hilly and the way good, and easily enough one hundred miles. The colder the weather the greater is the speed: seventy or eighty miles is a good average, but they were slow at the season of which I write."



Reindeer digging in the snow.

The chapter on the Lofoden Islands gives a great deal of information about the extensive fisheries of cod, in which over 700 fishing-boats are employed.

We had marked several other extracts relating to the domestic life of the Norwegian peasants in the high north, and to the interesting people of Dalecarlia; but enough has been given to show our readers that, while the narrative of these travels is free from the exciting scenes witnessed in Gorilla Land, it is not wanting in much that will be read with pleasure and remembered with profit.

NOTES

We take the following from the *Times*:—The medals in the gift of the Royal Society for the present year have been awarded by the Council as follows:—The Copley medal to Prof. Karl Adolph Wurtz of Paris, For. Mem. R.S., for his discovery of the organic ammonias, the glycols, and numerous other investigations which have exercised considerable influence on the progress of chemistry; the Davey medal to Prof. Adolf Baeyer of Munich for his synthesis of indigo; a Royal medal to Mr. Francis Maitland Balfour, F.R.S., of Cambridge, for his numerous and important contributions to animal morphology, and more especially for his investigations respecting the origin of the uro-genital organs and the cerebro-spinal nerves of the vertebrata, and for his work on the development of the elasmobranch fishes; a Royal medal to the Rev. John Hewitt Jellett of